STRATEGY RESEARCH PROJECT

STRATEGIC LOGISTICS FOR INTERVENTION FORCES

BY

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ABSTRACT

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This paper analyses the strategic logistics system of past force

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Shield/Desert Storm (DS/DS), Restore Hope, Support Hope, and

Joint Endeavor. It identifies problems with building the Time-

Phased Force Deployment Data (TPFDD), problems with Automated

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During past operations, the responsiveness of the logistics system was degraded by the system's lack of visibility of the status of personnel, equipment and requisitions. Moreover, an enormous amount of material was shipped to our forces in the theater, but it was not readily available because of poor visibility of assets in the theater. Such problems reduce the ability of combat forces to accomplish their mission. This paper analyzes the strategic logistics systems of past force projection operations covering the entire spectrum of war. It concludes with a recommendation for logistics concepts for the Army in the next century. The analysis cites Operations Desert Shield/Desert Storm (DS/DS), Restore Hope, Support Hope, and Joint Endeavor. It identifies problems with building the Time- Phased Force Deployment Data (TPFDD), problems with Automated Data processing (ADP) compatibility, problems in Command, Control and Communication (C3), and problems in training as causes for the lack of visibility in past operations. The paper concludes with recommendation for logistics concepts which should support the Army through the opening decades of the next century.

Historical Analysis:

Operation Desert Shield/Desert Storm:

The massive Persian Gulf war deployment was perhaps the greatest force deployment in the history of warfare. On 2 August,1990 forces from Iraq invaded Kuwait and seized control of the Emirate within 24 hours. The Iraqi army was battle tested, the fourth largest army in the world.[1] In response to the invasion, the U.S. military began deploying equipment, supplies, and personnel to strategic seaports and airports in Saudi Arabia. [2] The brevity of the warning time, the massive size of the arriving coalition forces, the lack

of prepositionned equipment, and the large distances between the U.S. and Saudi Arabia required U.S. logisticians to mass an enormous amount of lift in a short period of time.[3]

The U.S. Central Command (CENTCOM) was responsible for overall intheater logistics management. It developed policy and monitored and coordinated transportation and distribution operations. CENTCOM tasked the Army component (ARCENT) with management of seaport and airport operations. ARCENT also managed the surface transportation and distributed common items such as food, clothing, lubricants, and munitions to all services.[4] ARCENT headquarters planned for the ground operation and operated the theater Communication Zone (COMMZ), which coordinated joint, combined and coalition operations including Host Nation Support (HNS).

The operation revealed significant logistical limitations in deploying the force and maintaining visibility of the equipment and supplies shipped to the theater. Because of the immediate threat from Iraq, the CENTCOM commander made the early decision to front-load mobile combat units into Saudi Arabia, rather than logistics units. Thus the build up moved at unprecedented speed. The CENTCOM commander' decision to deploy service support units later in the deployment sequence seriously affected ARCENT's ability to provide the common user support to other services. ARCENT had to rely heavily on HNS to support the operation initially, because U.S. forces had limited in-country capability to store and retrieve equipment and supplies. The CENTCOM Commander's decision also triggered instant allocation of the most available and fastest strategic lift assets to insert combat units. This speedy movement ultimately resulted in an unsynchronized buildup of a theater support structure, the inserted force was critically unsustainable for the initial period of Operation Desert Shield.[5] The lack of theater

infrastructure further caused a significant shortage of Army surface transportation assets, including heavy equipment transports, tractor trailers, and material handling equipment. The Army could not fulfill its assigned role of providing support to the entire force on the ground. The Air Force and Marines had no choice but to establish their own transportation system which further complicated the management of transportation flow.[6]

An automated data system was supposed to regulate the massive amount of cargo and people to move into the theater of war. But CENTCOM had not finalized its Saudi Arabian plan, so deployment data were not automated. Most of the movement was managed manually, and planners improvised the force deployment list as they executed it. This lack of automation and midstream revisions in the insertion of units prevented airlift and sealift from operating at full capacity. Deploying units often did not know where and when to meet aircraft or to merge equipment with departing ships. This kind of confusion further caused planes to fly empty or with low priority cargo. Likewise, a single unit's equipment often arrived piecemeal on several ships.[7] Such a large operation needed a well-planned automated guidance system for the orderly deployment of units, equipment, and supplies.

However, logisticians admitted that they were unable to maintain visibility over equipment and supplies arriving in theater. They knew when a ship was scheduled to arrive, but they had only a general idea of the content of the cargo. Ships had incomplete manifests and mislabeled pallets. During the initial phase of the operation, logisticians at the ports had to empty containers in order to determine where to ship the items.[8] Because of the constant changes in the deployment sequence, some equipment arrived before the arriving units. Logisticians at the ports of debarkation did not have any

knowledge of the units' arrival time in country, nor did they know their location in country after the units had deployed. A backlog of supplies piled up at the port, overwhelming the supply personnel. Inventory control suffered. An iron mountain started to rise.

During the operation, container management was non-existent. So throughput became impossible. The Army had no viable tracking systems, used sloppy documentation procedures, and lacked sufficient material handling equipment to move the containerized cargo to appropriate distribution centers. Shippers filled the containers full regardless of destination within the theater to assure maximum use of the ship's capacity. Containers were filled with supplies addressed to several consignees, or they were loaded with unidentifiable loads with minimum documentation. Because the personnel needed to document the receipt of the material were not deployed early, stacks of containers piled up unprocessed in the ports. Lack of documentation further affected the tracking of the supplies. 50% of the containers arriving in the theater had to be opened to identify and reallocate their contents. The lack of material handling equipment and transportation assets augmented the backlog at ports. Then units lost confidence in the system and reordered the same items, thereby compounding the problem.[9] Finally, logisticians bypassed the supply system and established direct logistics links with their home bases to obtain critical items.

The airlift system was overloaded and could not keep up with demands. By December 1990, 7000 tons of cargo were lying on the ground at Dover waiting for shipment to Saudi Arabia. This supply dump exceeded the total airlift capacity by six fold.[10] Units saturated the airlift system with high priority demands because they had lost

confidence in the logistics system. Cargo and supplies were not properly prioritized, which resulted in backlogs at airports and seaports. In order to clear the ports, no priority was given to cargo except for first in/first out. Also, because the normal airlift system was overloaded, high priority items were delayed in reaching deployed units. To partially correct the problem, Transportation Command (TRANSCOM) established the Desert Express System and the Desert European Express System capable to deliver critical repair parts overnight from the U.S. and Europe. Although successful, the system worked around the established procedures to resupply the force.[11] Ingenuity, not consistently applied logistical practices, saved the day!

The lack of synchronization in automation caused significant problems in visibility. The major breakdown occurred between the requesting forward units and the source of supply. First, the operation occurred while the Army was changing to a more modern automated requisition system. Second, most of the Army's automated reporting and supply requisitioning procedures worked well in peacetime using commercial systems. But the lack of telephones in Saudi Arabia quickly led to serious problems. Units deployed with systems that couldn't synchronize software, so at least twenty six separate stovepipe data bases surfaced in the theater of operation. These included manual to batch processing, to on-line systems.[12] Visibility and confidence in the supply system quickly evaporated.

Operation Restore Hope Somalia

In April 1992, the United Nation (UN) Security Council approved Resolution 751, establishing the UN operation in Somalia (UNOSOM). Its mission was to provide humanitarian aid and facilitate the end of hostilities in Somalia.[13] During the next six

months, UN forces, which included a US contingent, delivered supplies to Somalis. However, by December 1992, the security situation worsened, forcing the UN to initiate Operation Restore Hope. The UN assigned the U.S. to lead and provide military forces to a multinational coalition; to secure air and naval ports; to provide key installations and food distribution points; and to provide security for convoys and relief organizations in support of UN and Non-Governmental Organizations (NGO) efforts to provide humanitarian relief. Between 9 December 1992 and 4 May 1993 this operation involved more than 38,000 troops from 21 nations; it finally succeeded in providing security and food throughout the country.[14] In May 1993, the UN picked up the mission to provide humanitarian support under Operation UNOSOM II. U.S. participation then consisted of logistical support and a quick reaction force.[15]

Immediately upon notification, CENTCOM deployed a humanitarian assistance survey team to assess the situation. It activated a Joint Task Force (JTF) to conduct emergency airlift of food and supplies into Somalia. In December 1992, CENTCOM ordered the first Marine expeditionary force to become the nucleus of a combined task force consisting of 20 nations in support of a large scale humanitarian intervention in Somalia. Concurrently, CENTCOM alerted the 10th Mountain Division for operation in Somalia. It would serve as the headquarters for all Army forces in Somalia and conduct military operations to provide security for the relief effort being conducted there.[16]

The deployment of forces and equipment to Somalia encountered similar problems as in operation DS/DS. During the planning phase, the 10th Mountain Division sustained contact with four different headquarters to determine force strengths. Strategic planners had developed plans for the operation and sought little input from the tactical

units. This caused significant problems as strategic planners did not anticipate the large number of logistics personnel required to support bare base logistics operations, particularly at sea and air ports of debarkation.[17] Transportation problem solvers or throughputters did not deploy early to solve problems at terminals and ports. Without this kind of on-site expertise, delays were inevitable, especially because the host country lacked infrastructure.

The 10th Mountain Division deployed to Somalia expecting to provide self contained logistics. But this unit was initially ill-equipped to overcome the logistical nightmare of Somalia. First , the unit encountered problems associated with the download of prepositional ships and the slow operations of sea and air ports of debarkation all directly attributable to the late deployment of key transporters. Second, the rapid arrival of Army units soon overcame the initial support capability provided by the Marine Corps IMEF Force Service Support Group (FSSG). Moreover, arriving Army forces overwhelmed the Marine Corps support capabilities before army logistics forces arrived in country. Therefore, 10th Mountain Division logistics units had to be consolidated to perform wholesale logistics functions.[18]

The TPFDD lacked the flexibility to support a contingency operation such as Restore Hope. There was no preexisting TPFDD for Somalia, and the deliberate planning process failed as the TPFDD continuously changed.[19] As CENTCOM developed the TPFDD, subordinate units made changes without control. Participants claimed that the TPFDD was validated for only a few days at a time. The lack of control and discipline resulted in changes in the TPFDD. Then loaded cargo never left the post

of debarkation or had to be unloaded at another port because it was no longer needed, likewise airlift was sent to carry cargo that never appeared.[20]

The lack of interface in automation caused significant problems in visibility. Unforecasted cargo, inaccurate data, and differences between codes used by deploying units were as prevalent as in DS/DS. The lack of interface between Joint Operations Planning and Execution Systems (JOPES) and the military standard transportation and movement procedures (MILSTAMP) caused a loss in visibility. Again, items could only be found after physical checks were made. [21] For example, at one time the U.S. Army was sending equipment back to the U.S. as excess while the Marines were requesting an augmentation of the same type of equipment due to shortages.[22]

There were six separate supply support systems in use in the Somali theater, which increased the loss of visibility. Units used the standard Unit Level Logistics System (ULLS) to request supplies. Requisitions were transferred through the Direct Support unit to the Defense Automated Addressing System (DAAS) for routing into the NICP. Units also used direct requests such as E-mail and phone to home station, which prevented any tracking by higher logistics managers. Units called depots and NICP's to shorten order and shipping time. The wholesale level honored the system, but tracking was difficult. At times, units used the UN system to obtain common use items. The system was slow, quality was uncertain, and delivery was unknown. Action officers and general officers also used the direct request system, which triggered the movement of supplies without the knowledge of the logistics personnel in the theater. Finally, the Army Materiel Command (AMC) established a back up system with their logistics representatives to obtain supplies. These systems got the job done, but it is obvious the

logistics ADP infrastructure did not work.[23] The lack of a theater level supply command

to discipline the supply system led to nonstandard initiatives. Without a centralized

theater management system, we lack the capability to cross level supplies in the theater,

likewise, we lose visibility of supplies. In such circumstances, iron mountains start to

appear on the horizon.

Operation Support Hope Rwanda

On 4 July 1994, Kigali, the capital of Rwanda, fell to the Tutsi dominated Rwandan

Patriotic Front. Thousands of Hutus, fearful of genocide, began to flee to Zaire or French

safe zones in south Rwanda and Burundi. Most fled to Goma, Zaire. Goma exploded

into a refugee camp of 1 million refugees. Soon humanitarian organizations were

overwhelmed by the need for food, medical assistance, and clean water. [24] By 24 July,

U.S. military personnel deployed to Goma, Kigali, and Entebbe, Uganda, to establish the

infrastructure for humanitarian support. Civilian Military Operation Centers (CMOC)

were established immediately in Goma and Kigali to synchronize support requirements

with the Non-Government Organizations (NGO). The U.S. policy at this time was to

assist the humanitarian effort, take no casualties, and leave. The US subordinated the

logistics effort under UN control; we avoided getting involved in political issues.[25] The

primary U.S. mission was to provide clean water, then to collect and distribute food and

other necessities.

Upon notification of the crisis, the European Command (EUCOM) JTF deployed

a survey team to provide on-the-scene assessment of the situation on a continuous basis.[26]

This early assessment was vital in determining the flow of follow on forces needed to

accomplish the mission. However, the JTF commander found it very hard to influence

the deployment of forces once requirements became more visible. The deployment was managed by phone. This resulted in backups and inefficient use of airlift. The JTF commander didn't have the ability to enter the JOPES system in order to build his force to accomplish the mission. Present procedures call for the TPFDD to be built by Unified commands. But, in these types of contingency operations, the commander should have the ability to reach deep into unit structures and call upon the required capabilities to accomplish the mission after his assessment of the situation.[27] This requires the Army to review how it structures forces and builds the TPFDD.

As in DS/DS and operation Restore Hope, several commands and agencies were involved in the input to the TPFDD. This created some problems in synchronization. As the JTF forward was trying to pull units they needed for the mission and change the TPFDD, the JTF rear and supporting commands were pushing units in the theater based on the previously established TPFDD. Additionally, peculiar to this operation, international relief and NGO requirements were added on top of an already confusing TPFDD without consideration of timing, flow, and dates of arrival. All this resulted in a backlog at ports of embarkation, unnecessary movement delays and a loss in visibility. Finally, the JTF started to organize the movement and circumvented the system through teleconferences and daily airlift messages.[28]

The JTF experienced similar problems in assets visibility as during previous contingencies. First, logistics units were not adequately prioritized in the deployment flow. The Material Management Center (MMC) and the Arrival/Departure Airfield Control Group (A/DACG) were bumped by higher priority units and did not arrive in theater until C+21. Prior to their arrival, no structure was in place to maintain accurate

visibility of supplies and equipment.[29] Second, in-transit visibility procedures were not

effectively in place. Personnel did not use the proper cargo documentation and

manifesting procedures, which resulted in the loss of visibility during the airlift. These

problems forced the JTF commander to allocate personnel at APOD to meet each

aircraft to identify the cargo, break it out, and get it to the proper place.[30]

The JTF commander also encountered problems in ADP. First, the commander

had no capability to precisely track individual loads and to forecast arrivals because of an

interface problem between the Global Decision Support System (GDSS) and JOPES.

The interface between these systems was inadequate to provide accurate and timely

tracking of load movement data, it works only when the GDSS data is loaded into the

JOPES in a timely and correct manner. HQ Air Mobility Command (AMC) was

responsible to load GDSS into JOPES, but poor quality input caused problems. We need

a link to connect strategic airlift , the JTF and the customers.[31]

Second, the ADP required to sustain the force in the theater suffered because of

the problems in the TPFDD. During Operation Support Hope, the tactical requisition

system Standard Army Automated Requisition System (SAARS) was introduced early,

but it could not be implemented because of delays in establishing a communication

system. Therefore, for several days we were unable to send out requisitions.[32]

.   Operation Joint Endeavor Bosnia:

Operation Joint Endeavor offers yet another example of US involvement in peace

and humanitarian operations. The Dayton agreement (December 1995) had led to a

general agreement for peace among all warring parties in Bosnia. The mission to

implement the peace agreement thus fell to the North Atlantic Organization (NATO).

The US committed the 1st Armored division under the C2 of the NATO Allied Ready Reaction Corps (ARRC) to the operation. The U.S. also provided augmentation to the ARRC headquarters and a National support Element in Hungary and Croatia.[33]

Strategic ambiguity plagued the operation from the start. It was not clear until the actual signing of the peace agreement what type of force package was needed to accomplish the mission. At the conclusion of the planning phase, the TF commander's plan called for a deliberate balanced deployment so he could tailor his forces in-country. The TF led force package would augment the V Corps national support element in establishing the intermediate staging base in Hungary. The TF would then insert engineers and combat forces to establish lines of communication into Bosnia. The Joint Endeavor organization anticipated a single US division organized with multiple brigades, numerous corps level support units directly under division control, and U.S Army Europe (USAREUR) forward as the National Support element. However, the signing of the peace agreement called for the immediate entry of a sizable combat force into Bosnia. Such a quick entry altered the deployment packages and minimized the deployment of combat service support assets in the theater. It desynchronized the deployment activities. [34]

The decision to deploy combat forces in the theater at the cost of logistics forces affected the sustainment of these same forces in country. EUCOM enlisted the Logistics Civil Augmentation Program (LOGCAP), so civilian contractors would build the forward logistics bases as forces arrived in the area. LOGCAP's requirements for movement of supplies conflicted with requirements to move the combat forces. The lift was finally provided to the combat forces, causing a shortage in logistics support.

Therefore, we had inserted an unsustainable force. Units thus delayed deployment or diverted to other bases until the logistics bases were established. Second, the task force arrived in country without its main support and class IX stocks. Thus the force was severely limited in support. Had the TF been required to transition to combat operation, it would have found itself with severely reduced combat power.[35]

Finally, several deployment management systems designed to assist in deploying the force were either overlooked or inefficiently used. The failure to use the Transportation Coordinator Automated Command and Control Information System(TC-ACCIS), which automates the input of unit movement data and generates deployment equipment list for loading in the JOPES system via the computerized movement planning and status system, was significant. It prevented JOPES from automating construction of the TPFDD and contributed to our inability to maintain visibility of the composition of the projected force.[36]

Operation Joint Endeavor benefited from the ADP technological improvements gained from lessons learned from past contingency operations. In this operation, logisticians sought to achieve Total Asset Visibility (TAV) by tracking the location, condition, and consignee of supplies and equipment from the factory to the foxhole. Logisticians planned to use radio frequency tags, detection devices, and computer systems to track the movement of items through the entire distribution system.[37] Even though Radio Frequency (RF) tags were used to maintain visibility over equipment throughout the deployment, these tags did not sustain visibility as planned. First, only one station was set up to load the RF tags with the data needed for tracking of containers and supplies. One station could not handle the large quantity of containers to be tagged.

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Second, hardware (interrogators in this case) was not established at all major intersections along the Lines Of Communication (LOC). The lack of interrogators throughout the LOC prevented logisticians from tracking RF tagged items throughout the distribution system. Third, the Automated Manifest System (AMS), used by the direct support units to improve accuracy and expedite processing, did not arrive in country until late in the deployment Therefore, containers received prior to the unit's arrival were not processed correctly. Once operational, the AMS was able to track and distribute supplies.[38]

In summary, the U.S. Army has encountered the same recurring problems in deploying and maintaining visibility of personnel, equipment, and supplies in support of four recent contingency operations. During DS/DS, visibility over equipment and supplies was lost in the theater due to the sloppy documentation systems, the continuous changes in the deployment sequences, the erroneous method of loading and shipping containers, and the lack of standardization in ADP systems to say nothing of the magnitude and complexity of the operations themselves. The deployment forced CENTCOM to use a manual system to monitor the TPFDD. Lack of automation, along with midstream revisions in unit's movement and front-loading of combat units at the cost of deploying key logistics units, caused CSS austerity throughout the operation. It also caused a loss in visibility as personnel and equipment were not processed correctly. Ultimately, the loss of visibility caused loss of confidence in the system by logisticians and tacticians alike.

During Operation Restore Hope, the same problems occurred. Combat forces deployed early thereby precluding key transporters from deploying and assisting in the

synchronization of the arrival of follow-on forces at Aerial Ports Of debarkation (APOD). The TPFDD was non-existent; it had to be built as the units deployed to the theater of operation. As seen during DS/DS, the TFDD changed continuously, a significant ADP disconnect occurred, and too many unsynchronized ADP systems surfaced. All this led to an undisciplined logistics system and loss of visibility.

During Operation Support Hope, logistics units were once again not prioritized in the deployment. So the JTF commander was hindered in influencing the deployment of forces once they were on the ground. There were significant interface problems in ADP, along with sloppy documentation in shipping supplies to the theater of operation. Again, logisticians lost visibility of supplies and equipment.

During Operation Joint Endeavor, the TPFDD was adjusted three times. Combat forces were once again send forward at the cost of critical CSS forces. This resulted in a desynchronized deployment and in an unsustainable force in theater. During the operation, the TPFDD ADP system was discarded and replaced by a manual system. Although assets (hardware) needed to maintain visibility over supplies were deployed, they were not used to their capacity. All this resulted in a loss of visibility.

By now, we have unquestionably identified the problems, how can we fix them? If we are going to offer the force of 2025 adequate logistical support, we need to make some critical changes in four areas: Force structure, ADP improvement, C3, and technology.

History has shown that , regardless of the type of operation, combat forces will always deploy first at the cost of CSS forces. Also, the TPFDD will always change to meet mission requirements. Further, human errors will always play havoc with

deployment documentation and manifests. We can, however, circumvent these issues and deploy forces that are sustainable and synchronized while meeting the commander's intent. First, we must change the way we look at the CSS force structure. Logisticians need to consider building a CSS force based on a modular system. We must build logistics modules tailored to perform a specific function. For example, we could develop such modules as an APOD receiving unit or a seaport unloading unit each designed to carry out a specific function. The CSS community should then arm the modules with the technology and assets to accomplish this function. The technology should enable the unit to talk direct to the national provider in the U.S. and to the JTF commander to obtain follow-on support and to keep the commander aware of the situation. Technology would also give the modules the mobility to navigate the battlefield quickly to respond to changes in mission. These modules should then deploy with the combat forces as part of a force package, capable of performing the specific function they were trained and built to do. This approach to force structure is not new. USEUCOM attempted to use this approach during the initial deployment for operation Joint Endeavor. The CSS community must refine the system to build units in accordance with the functions they must accomplish, while keeping them small but technologically updated.

The modular system allows units to build a TPFDD that is agile and flexible. However, commanders must have the capability to move modules within the TPFDD once on the ground. The system allows the TPFDD to grow from the present system, which is still linked to past operations and has not been developed to handle future contingencies such as operation Support Hope, to a more fast-paced responsive system ready to respond to changes in the situation.

Naturally, the commander's ability to manipulate the TPFDD is directly linked to the level of ADP support he will receive. By 2025, I anticipate ADP improvements which will enable commanders to obtain and maintain visibility of all assets at all times during an operation. Commanders will thus have the ability to influence not only the movement and deployment of initial entry forces but also to influence the flow of logistics throughout the operation. The Joint Total Asset Visibility (JTAV) program, built in response to the growing importance of TAV to a restructured Defense Logistics System, has developed an implementation plan that integrates TAV throughout the Department of Defense (DOD). The objective of JTAV is to develop a responsive system, easily understood by all and capable of rapid deployment to contingency areas. The CINCS and JTF commanders would use the system to enhance the planning, deployment, and movement of forces in transit to respond to changing strategic guidance. The TAV capability provided through JTAV will allow JTF commanders all the information needed to maintain visibility of all assets in theater. The plan will provide commanders with the capability to track orders from units, vendors, shipping activities, and port operators throughout the supply system; it will give materiel managers at the strategic level visibility of all assets not only throughout the system but also throughout services systems.[39]

The JTAV office has developed an implementation plan that synchronizes four national systems to accomplish total visibility of assets. The Logistics Information Processing System (LIPS) would serve as DOD's central depository for information on the status of requisitions. The Inventory Control Point Automated Information System (ICP AIS) would be the permanent data repository for information on all ICP managed

assets. In other words, it would maintain visibility on all stocked items from retail to wholesale levels by location and codes. The Global Transportation Network (GTN) developed by TRANSCOM would provide visibility on unit and non unit shipment (personnel, equipment and supplies) data to include visibility on medical patients. Finally, the JTAV would develop the Joint Theater Logistics Automated Information system to provide visibility of the location and status of in-theater logistics assets.[40]

JTAV plans to use a client server architecture consisting of server/data base manager, a network manager, and a communications manager. It will develop a deployable JTAV package in conjunction with the CINCS to support activities equivalent to an Army Corps, Marine expeditionary force, Navy Fleet HQ, and Air Force numbered air force. Deployed units will be able to access JTAV with existing military applications.[41] The JTF staff will be able to access supplies in transit and in storage. It will process information from CONUS through the links with LIPS and GTN and merge this information with the information received from in-theater logistics modules, thereby giving the JTF commander the visibility on all his assets and the capability to manipulate logistics to meet mission requirements.

The JTAV modernization system not only allows logisticians to obtain and maintain visibility of all personnel, equipment and supplies in the system but also to modify the logistics request system significantly. Since managers will have visibility of supplies at all times and have the ability to change the flow of supplies at a moment's notice, we will no longer need the existing priority system and the large stockpiles of supplies located at all logistics levels. The new ADP system gives the logisticians the opportunity to streamline the logistics system into a more flexible and responsive system.

The ability to control agile CSS modules on the battlefield, and to harness the power of the revolution in information technology surface the need for a centralized logistics command and control system. Command structures, such as the JTF, should include a logistics commander with the necessary ADP and trained personnel to monitor all logistics assets in the theater of operation, deploy early to assess the situation, and take immediate strategic level action concerning movement of personnel and equipment (both military and civilian) to respond to changes in mission. The JTAV ADP system, as previously discussed, would give the JTF logistics commander the ability to modify the TPFDD as soon as he is on the ground and the ability to maintain visibility on personnel, equipment and supplies shipped to the area of operation. However, although technology gives logisticians the ability to know where the assets are at all times, it likewise demands stronger restrictions on the manipulation of the system. Given the new TAV capability, a JTF logistics commander must establish strict guidelines on who can input changes to the deployment of forces in country and who monitors the arrival and transfer of logistics assets in theater. Such real-time, on-site control and authority over logistics is revolutionary. In the past, the logistics tail could unfortunately wag the big dog of JTF command. Now that big dog will wag his tail any time, any way he sees fit!

Finally, ADP improvements are a subset of the revolution in information technology. They allow logisticians to look at new ways to do business and improve the logistics systems during contingency operations. Nevertheless, the level of technology available today (and probably in 2025) does not significantly change the way we do business as logisticians. Current technology allows us to improve logistics systems by giving us total visibility on all assets and by enabling us to process information faster.

But it does not alleviate the need for the extensive quantity of logistics needed to support U.S. deployments throughout the spectrum of war. Careful analysis of the primary logistics requirements in a conflict reveal, as always, the critical need for fuel, ammunition, and food as the significant logistics requirements for support of any deployment of forces. So, the revolution in information technology does not mean the U.S. Army can decrease the logistics tail. Therefore, prior to implementing a significant change in logistics or implementing a genuine logistics revolution, the US Army must undergo a deeper technological revolution and develop totally new systems, such as tanks that do not use fuel and standardized ammunition. In other words, the US Army must develop systems that require very little or no logistics tail as opposed to traditional systems that require long and extensive logistics tail. The US services need to invest money in Research and Development (R&D),even at the cost of restructuring the force. Furthermore, once these systems are identified, all services must join in procuring and using them, rather than (business as usual) each service designing, developing, and deploying its unique model. The result will be a simple logistics system, a small logistics tail, and a smaller but lethal supportable contingency force.

Conclusion:

This study identified key logistics problems which occurred during recent contingency operations covering the entire spectrum of war. Problems in visibility, in building and managing the TPFDD, in ADP compatibility and in Command and Control hampered logistical support to varying degrees in each operation. Logisticians are aware of these issues; they have taken steps to correct them by developing and implementing the JTAV plan. We can eliminate these problems by building a centralized and

permanent command and control system that includes a logistics commander and a logistics force built on tailored logistics modules. This new capability would enable logisticians to take full advantage of the JTAV plan. These steps capitalize on the revolution in information technology; they will certainly improve today's logistics systems.

What these improvements will not do is to create the revolution in military logistics which is needed by 2025. The real revolution in military logistics will occur only after our research community provides us with revolutionized combat equipment that minimizes the logistics tail needed to support it. The Army leadership must realize the need for new equipment and allocate the necessary resources to develop it.

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[17]   David T. Stahl, SL Arnold, " A Power Projection Army in Operations Other Than War," Parameters XXIII no.4 (Winter 1993-1994): 11.

[18]   Jeanette K. Edmunds, "Organizing Logistics for Peace and War, The Necessity of a Trained Joint Logistics Support Command Headquarters," National Defense University, Essays On Strategy XIII (1996): 235.

[19]   David B. Kassing, Transporting the Army for Operation Restore Hope (Santa Monica: Rand, 1994), xii.

[20]   Ibid., 13.

[21]   Allard, 46.

22   Ibid., 47.

23   Department of the Army, <u>UNOSOM II lessons learned,</u> US Center for Army lessons Learned (FT. Leavenworth, 1996), p.II-10-21.

24   Edmunds, 139.

25   Ibid., 140.

26   Headquarters US European Command, <u>Operation Support Hope, 1994 After Action Review,</u> (USEUCOM, 1995), 2.

27   Ibid., 34.

28   Ibid., 14-4.

29   Ibid., 8-4.

30   Ibid., 8-5.

31   Ibid., 14-9.

32   Ibid., 8-2.

33   Department of the Army, US Army Training and Doctrine Command center for Army Lessons Learned, <u>Operation Joint Endeavor Task Force Eagle Initial Operations,</u>(FT Leavenworth, KS. may 1996),ix.

34   Ibid., 9

35   Ibid., 5.

36   Ibid., 13.

37   Ibid., 163.

38   Ibid., 164.

39   Department of Defense, <u>Defense Total Asset Visibility Implementation Plan,</u> (Washington: US Department of Defense,November 1995), 1-5

40   Ibid., 2-3.

41   Ibid., 6-4.

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